THE LORICATES OF THE NEOZELANIC REGION.

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Continued from Vol. vi., p. 168.

(Plate iii.)

V. Family Cryptoconchidae (Continued.)

x. Genus Notoplax.

1861. *Notoplax* H. Adams, P.Z.S., 1861, 385. Type by monotypy *Cryptoplax* (*Notoplax*) *speciosa* H. Adams.

1878. *Macandrellus* Dall, Proc. U.S. Nat. Mus., i., 1878, 299. Type by original designation *Acanthochites costatus* H. Adams & Angas (specimen from Port Jackson, Australia).

1893. *Loboplax* Pilsbry, Nautilus, vii., 32. Type by original designation *Chiton violaceus* Quoy & Gaimard.

1928. *Pseudotonicia* Ashby, Trans. New Zeal. Inst., 58, 1927, 392, February 14, 1928. Type by monotypy *Tonicia cuneata* Suter.

Shells small to medium, broadly oval, tegmentum rather small, sculpture generally of granules, but sometimes almost smooth (*Pseudotonicia*); lateral and pleural areas confluent, rarely a dividing rib being formed of massed granules; dorsal area more or less differentiated, rarely distinctly marked off; anterior valve indefinitely radially five ribbed; posterior valve proportionately large; insertion plates large; anterior valve showing five slits, median one slit and posterior multislit; girdle very broad, varying from leathery with obscure sutural tufts, to completely spiculose with dense large tufts.

This group is difficult to define, though outstanding members have been easily distinguished as *Notoplax*, the type of which group is very notable, and *Loboplax*, whose type is also very remarkable. The girdle shows intermediates and the tegmentum also varies, so that it becomes a matter of opinion as to the limits of the groups. Ashby has unfortunately complicated matters for Neozelanic students with a series of papers on these shells, in which his rambling comments generally mutually contradict each other. Ashby suggested Iredale did not understand the characters of *Craspedochiton* when he considered it a section of the genus *Acanthochites*, yet displays his own ignorance of the essential features by describing as a new species of *Notoplax* the immature of one of his own species which he allotted to *Craspedochiton*. We cannot go into detail correcting Ashby's numerous misstatements and mistakes, but simply warn students that every one of his remarks must be carefully criticised. His value of taxonomic characters in this group is worthless, as he has described immature shells in different genera more than once, and his so-called "phylogenetic classifications" are not even amusing.

31. Notoplax violacea.

(Plate iii., figs. 1, 5-8.)

1835. *Chiton violaceus* Quoy & Gaimard, Voy de l'Astrol. Zool., iii., 403, pl. 73, figs. 15-20. Tasman Bay, N.Z. Type in Paris Museum.

1836. *Chiton violaceus* Deshayes, Hist. Anim. s. Vert. (Lam.), ed. 2, vii., 519.

1843. *Acanthochaetes violaceus* Gray, Travels in N.Z., Dieff., ii., 246.

1847. *Chiton violaceus* Reeve, Conch. Icon., iv., pl. 8, fig. and sp. 41.
1847. *Chiton porphyreticus* Reeve, Conch. Icon., iv., pl. x., sp. and fig. 56, April. New Zealand. Type in British Museum.
1852. *Chiton violaceus* Gould, U.S. Epl. Exped., 331, fig. 420.
1872. *Katharina violacea* Hutton, Trans. N.Z. Inst., iv., 1871, 182.
1873. *Katharina violacea* Hutton, Cat. Marine Moll. N.Z., 50.
1873. *Acanthochaetes porphyreticus* Hutton, Cat. Marine Moll. N.Z., 50.
1880. *Acanthochites porphyreticus* Hutton, Man. N.Z. Moll., 117.
1880. *Acanthochites violacea* Hutton, Man. N.Z. Moll. 118.
1893. *Acanthochites violaceus* Pilsbry, Man. Conch., xv., 39, pl. 3, figs. 67-73.
1897. *Acanthochites violaceus* Suter, Proc. Mal. Soc., ii., 193.
1904. *Acanthochites violaceus* Hutton, Index Faunae N.Z., 86.
1905. *Acanthochites violaceus* Hamilton, Col. Mus. Bull., No. 1, 36.
1909. *Loboplax violacea* Thiele, Revision Chitonen, pt. i. (Chun's Zoologica, heft 56), 37, pl. v., figs. 13-15.
1913. *Acanthochites violaceus* Suter, Man. N.Z. Moll., 30. Atlas. pl. 2, fig. 11, pl. 4, fig. 5.
1914. *Macandrellus violaceus* Iredale, Proc. Mal. Soc., xi., 130.
1915. *Macandrellus violaceus* Iredale, Trans. N.Z. Inst., 47, 1914, 425.
1922. *Acanthochiton violacea* (*sic*) Ashby, Trans. Soc. South Austr., xlvi., 578 (type examined ?).
1922. *Acanthochiton violaceus var. papillo* Ashby, Trans. Roy. Soc. South Austr., xlvi., 578 (error).
1923. (*Acanthochiton violaceus*) Lamy, Bull. Mus. d'Hist. Nat., Paris, 1923, 260, footnote (correction).
1924. *Loboplax violaceus* Odhner, Vidensk. Medd. Dansk. Nat. Foren. Bd., 77 (N.Z. Moll.), 8.
1926. *Loboplax violaceus* Ashby, Proc. Mal. Soc., xvii., 16, pl. iii., fig. 1a-c.
1926. *Loboplax violaceus var. dunedinensis* Ashby, Proc. Mal. Soc., xvii., 18, Dunedin, N.Z.
1926. *Loboplax violaceus var. papillo* Ashby, Proc. Mal. Soc., xvii., 18.
1928. *Notoplax* (*Loboplax*) *violaceus* Ashby, Trans. N.Z. Inst., 58, 1927, 401, February 14, 1928.
1928. *Notoplax* (*Loboplax*) *violaceus var. papilio* Ashby, Trans. N.Z. Inst., 58, 1927, 401, February 14, 1928.

As there has been some doubt as to the correct determination of *Chiton violaceus* Q. & G., we reproduce their description: "*Chiton violaceus* Q. & G., Planche 73, figs. 15-16 (Le même, variété, figs. 17-20). Chiton, corpore ovali, convexiusculo, carnoso, levi, subrubro aut luteo, duodeviginti punctis pilosis notato; ossiculis confertis triangularibus violaceis; primo hexago. Varietas, pallio lutescente punctis rubris irrorato.

Cette belle espèce fait le passage des Chitonelles de M. de Blainville aux Oscabrelles de M. de Lamarck. En effet, ses valves sont rétrécies, arrondies, en partie recouvertes par le manteau. Elles se touchent cependant encore, mais seulement par leurs extrémities. Les grand faisceaux de poils sont remplacés par dix-huit pores fort petites, qui contiennent encore des soies qu'on ne peut voir qu'a la loupe. Les branchies ne sont point aussi longues que dans les Chitonnelles; plus cependant que dans l'Oscabrelle proprement dite, où nous allons voir les osselets ne plus se toucher du moins en partie.

L'Oscabrion violet est ovalaire, un peu allongé, plus elargi en arrière qu'en devant, à manteau épais, charnu, lisse, d'un brun de chocolat clair, ayant, de chaque côté, près des osselets, deux petits pores rugueux. Les

osselets, moins le premier, sont en forme de selle, larges, comme ailés, leur partie saillante est triangulaire, en forme d'écusson elargi en arrière, portant, au milieu, une carène en V. transversalement striée, tandis que les côtés sont granuleux, écailleux. Les apophyses d'insertion sont beaucoups plus grandes que le disque, subarrondies avec une scissure latérale qui les divise en deux de chaque côté. Tous les osselets sont à peu près de même grandeur et de même forme, excepté les deux extrêmes. L'antérieur, arrondi, a six dents, qui correspondent à autant d'angles en relief de l'ecusson, le postérieur n'en a que cinq, qui sont bifurquées. La coquille est d'un beau violet veloutè en dessus, un peu plus foncé sur le triangle médian; elle est verte en dessous. Le pied est d'un jaune légèrement rougeâtre. Les lamelles branchiales, au nombre de vingt de chaque côté, occupent environ les deux tiers posterieurs du corps. Le pied est proportionellement, êtroit, et le voile buccal très-circonscrit. La variéte que nous faisons figurer a la manteau jaune, avec des taches et des stries transverses rougeâtres. La coquille est plus pâle.

Il est des individus sur lesquels on ne peut voir les pores lateraux, qui sont les ouvertures de canaux aquifères, par lesquels nous avons vu jaillir l'eau que ces Mollusques absorbent.

Cet Oscabrion habite l'anse de l'Astrolabe, à la baie Tasman de la Nouvelle-Zélande.

"Nous possédons un individu, dont les valves usées sont plus larges et moins longues que dans les autres. Dimensions, Longueur 20 lignes. Largeur 13 lignes. Hauteur 6 ou 7."

This is the complete account, and it will be seen that the word "*papillo*" does not occur in any place. Ashby has written "*Acanthochiton violaceus* var. *papillo*" Type. On another card marked 'Quoy et Gaimard, 1883, N.Z.' is a dissected specimen with anterior valve missing. All valves smooth and of peculiar shape. I am rather doubtful whether this is referable to the same species. It is referred to in Voy. de l'Astrolabe at top of page 520 under the name *'papillo.'*"

This was written from notes carelessly made in a few minutes in the Paris Museum, and, although Lamy has drawn attention to the blunders, Ashby has twice reiterated his errors. We would point out then that on page 520 of the Voy. of the Astrolabe, Vol. iii., a bivalve (*Pholas globulosa*) is being described. *Chiton violaceus* appears on pages 403-05, and there is a "varietas, pallio . . ." which may have misled Ashby. However, "Quoy et Gaimard, 1883, N.Z.," should have warned Ashby, as both these great collectors were dead before then; neither would 1833 have been correct, and apparently the shell examined by Ashby was not related to our species in any sense, but may be *Chaetopleura papilio* Spengler.

Curiously the only synonym is *Chiton porphyreticus* Reeve, whose description reads: "Shell somewhat elongately ovate, valves punctured in the middle, verrucosely rough on each side, with a single ridge along the edge of the lateral areas, anterior terminal valve radiately five-ribbed, posterior small, blunt; cinereous purple, with a conspicuous yellow spot, dotted with black at the edge and stained with bright purple in the middle, along the umbonal summit of each valve; ligament coriaceous, spreading partially over the sides of the valves, and furnished with small tufts.

"*Acanthochaetes violaceus* Gray, Appendix to Dieffenbach's, New Zealand (not *C. violaceus* Quoy).

"Habitat: New Zealand.

"A beautifully painted species, easily distinguished by the bright purple colouring of the umbonal summit, which appears constant in all the speci-

mens I have seen; the punctures of the central portion of the valves also afford an unusual contrast with the rest of the surface which is raised in small warts."

Ashby has commented: "The Tasman Bay, Wellington, and Doubtless Bay specimens show some individual variation, but not wide differences, while those from Dunedin have the diagonal rib in the median valves ill-defined and completely granulose, and the ray-ribs in the anterior valve do not have the highly raised growth ridges common to the specimens from the other localities. If these characters are supported by the examination of a longer series, it might be well to distinguish this variety under the name *dunedinensis*."

So far the variation seems indefinite, although at first sight Ashby's distinctions appear tenable, but a series from any locality soon dispels that supposition. The specimen figured shows the anterior valve with strongly raised growth ridges, and it came from Dunedin.

32. NOTOPLAX MARIAE.

(Plate iii., fig. 35.)

1908. *Acanthochites* (*Loboplax*) *mariae* Webster, Trans. New Zeal. Inst., 40, 1907, 254, pl. xx., figs. 1-11. Orua Bay, Manukau Harbour, N.Z. Type ? in coll. Brookes.

1909. *Loboplax stewartiana* Thiele, Revision Chitonen, pt. i., (Chun's Zoologica, heft 56), 37, pl. v., figs. 8-12. Stewart Is., N.Z. Type in Paris Museum.

1910. *Acanthochites* (*Craspedochiton*) *mariae* Iredale, Proc. Mal. Soc., ix., 102, June (= *stewartiana*).

1913. *Acanthochites mariae* Suter, Man. N.Z. Moll., 28, 1080, Atlas, pl. 4, fig. 3.

1914. *Macandrellus mariae* Iredale, Proc. Mal. Soc., xi., 130.

1915. *Macandrellus mariae* Iredale, Trans. N.Z. Inst., 47, 1914, 425.

1926. *Notoplax* (*Amblyplax*) *mariae* Ashby, Proc. Mal. Soc., xvii., 23, April 30.

1926. *Notoplax* (*Amblyplax*) *mariae stewartiana* Ashby, Proc. Mal. Soc., xvii., 25, pl. ii., figs. 1 a-c.

1926. *Notoplax* (*Amblyplax*) *mariae haurakiensis* Ashby, Proc. Mal. Soc., xvii., 26, pl. ii., figs. 3 a-c. Hauraki Gulf, 20 fathoms, N.Z. Type in Auckland Museum, N.Z.

Webster described this species as follows: "Shell elongated, elevated, dorsal angle about 110. Colour greenish-grey, minutely freckled with dark, latero-pleural areas crowded with flattened granules, strap-shaped or oval, as in *A. zelandicus*, all the valves being bordered with irregular, raised, white, pebble-like granules of the same type as those in *A. violaceus*, with which this species also agrees in having five prominent lobes on the anterior valve, the ribs being of white raised elongated granules, the ribs of all valves similarly marked; another characteristic feature is the presence of three almond-shaped white granules just within the posterior edge of each median valve. Dorsal areas wedgeshaped, the edges being serrated, sculptured with cuneiform lyrulae. The posterior valve has the tegmentum longer than the breadth, the hooked mucro being slightly postmedian; the area behind it is concave, white, composed of oblong granules, bordered on either side by others of longer form, but of the same colour. Anterior valve with 5 slits corresponding to the ribs; median valves with 1 slit, the posterior with many slits, the denticles being mostly bifid. In the type these denticles are perpendicular, and not visible from

above; in other specimens they extend outwards, and may be seen beyond the tegmentum; in such specimens the mucro is not so prominent, the white area narrower, and composed of long granules like those bordering the oblong granules of the type, these latter being altogether absent, as also are the raised white borders of the valves. It may be that these specimens have not attained their full development, as none of them approach the type in size. Interior blue-green, white towards the edges. Girdle grey-green, leathery, a minute pore at each suture, 4 on anterior valve. The dotted lines on figs. 5 and 7 show the limit of the white granular patch. Figs. 6 and 7 represent the posterior valve of a second specimen. Length of dried specimen, 35 mm.; width, 18 mm. Habitat: Orua Bay, Manukau Harbour, New Zealand; on rocks at low tide. Type in Coll. W. H. Webster. The type is unique; seven of the less-developed specimens were found. The apparent hybridism is striking, especially as I have never found *A. violaceus* on the west coast, though a very small form of *A. zelandicus* is fairly common."

Shortly afterwards Thiele described a shell labelled, in the Paris Museum, Stewart Island, as *Loboplax stewartiana,* but the description and figures which are here reproduced fit the *"mariae"* of Webster so completely that it was at once regarded by Iredale and Suter as synonymous.

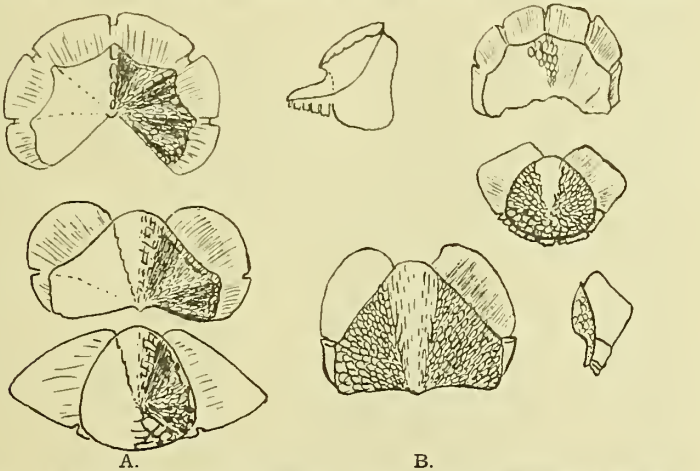

Fig. 1. A. *Acanthochites* (*Loboplax*) *mariae,* copy of Webster's figures. B. *Loboplax stewartiana,* copy of Thiele's figures.

On account of the locality, Ashby has used the name subspecifically, but we now suggest that the locality is false and that the Paris Museum shells came from the North Island. This is quite a legitimate suggestion, as prior to Thiele's examination the collection of Loricates in the Paris Museum had been mishandled by Rochebrune, labels and specimens being disarranged and even lost. Since Thiele's time, Dupuis has continued the confusion and dispersal of specimens, so that Ashby's notes on the "types" are valueless and misleading, and no good use can be made of reference to the Loricate collection at this time. When Ashby admitted *stewartiana* as a subspecies he also proposed *haurakiensis* as a subspecies for speci-

mens dredged in Hauraki Gulf. We have examined similar shells and cannot separate them by any constant feature from the shore shell, so relegate *stewartiana* and *haurakiensis* to *mariae* absolutely until better material allows of clear distinction. It is possible that *haurakiensis* may be the same as the species Ashby later called *brookesi* whose description follows. The variation seen is at present inexplicable, and we can only hope that some student in New Zealand will attempt a study with ample material, and differentiate the species, or else unite them with reliable data. While we are prejudiced in favor of separation, we have been compelled to advocate unity.

33. Notoplax brookesi.

(Plate iii., figs. 33, 34.)

1929. *Notoplax (Amblyplax) brookesi* Ashby, Trans. New Zeal. Inst., 60, 370, pl. 32, figs. 1, 2, 3, 4, August 29. Tauranga Harbour, 3 fathoms, N.Z.

Ashby's description is here reproduced, as this appears to be a very distinct species, but is another example of the valuelessness of Ashby's taxonomic remarks, as his good photographs show valves of a typical *Loboplax*, certainly not of an *Amblyplax*, a subgenus of his own introduction.

"General appearance: Valves reduced, girdle very broad, encroaching slightly at the sutures, anterior valve ray-ribbed, lateral area defined by a diagonal fold, dorsal area strongly raised and longitudinally lined, pleural and lateral areas equally sculptured with flat, elongate, spaced granules, coloured with mottlings varying from dark-grey to greenish-grey, thereby giving to the whole shell a greenish-grey tone. The girdle is almost unique, being densely clothed with very long, slender, adpressed white spicules, almost resembling long, white hairs.

"Anterior valve: Five ray-ribs, which are barely raised, but defined by large, flat, elongate, ovate granules, the whole valve is decorated with large, flat, ovate to subacute granules, commencing minute at the apex and increasing in size towards the girdle.

"Median valve: Dorsal area beaked, raised, whitish, with longitudinal lining, but only longitudinally grooved near the beak; this area is closely transversely grooved, and in addition is irregularly crossed by several broad growth grooves; pleural area is evenly decorated with large, elongate, subacute flat grains; these increase in size anteriorly, and towards the girdle; the lateral area is indicated by a diagonal fold, the posterior margin is recurved slightly at the girdle, sculpture is similar to that of the pleural area, except that the granules are larger.

"Tail valve: Mucro posterior of central, slope immediately behind mucro very steep, from there to the posterior margin concave, the broadly wedge-shaped portion immediately behind mucro is white, and the grains are large, circular and convex; the rest of this valve decorated with flat, elongate, ovate, subacute granules similar to the median valves, except that the granules are here less pointed.

"Articulamentum: Inside white merging into pale bluish-green towards dorsal ridge and posterior margin, slits, anterior valve 5, median 1/1, tail 11, teeth very thick in tail valve, edge blunt, sometimes notched in the middle, shallowly grooved on the outside, the insertion plate rather broader than is usual in this subgenus; sutural laminae in median and tail valves produced forward and broad, sinus between, medium, insertion plate of anterior valve broad, finely grooved on outside, teeth sharp.

"Girdle: Broad, densely clothed with adpressed, long, slender, white spicules, measuring, in complete example, 812 mmm. long by 37 mmm. at base, tapering to 25 mmm. towards the point; hair tufts composed of white, glassy, straight spicules, measuring 1,320 mmm. in length, by 37 mmm. to 50 mmm. at base, tapering to 13 mmm. at point.

"Habitat: Tauranga Harbour, dredged, 3 fathoms.

"Comparisons: As compared with *oliveri*, the insertion plate of the anterior valve is double the width, the insertion plate of the tail valve is broader and more dentate. It is easily distinguished from *oliveri*, *mariae*, and the two subspecies of this latter, *stewartiana* and *haurakiensis*, by the absence of the "comma-like" grooving of the dorsal area, and the spiculose girdle-clothing, from *rubiginosus* and *foveauxensis*, by the sculpture, consisting of flat, instead of convex grains, and the long slender spicules of the girdle-clothing. This form is nearer *Notoplax* s.s. than any other known member of this subgenus."

We have figured a specimen received from the late Captain J. Bollons, many years ago, as dredged in Hauraki Gulf, which we describe here:—

Shell elongate, valves thin, narrow, deep, flattened, back rounded, posterior valve comparatively large, girdle broad, thickly spinulose, sutural tufts prominent. Sculpture fine. Colour dull cream. Anterior valve faintly five-waved, otherwise completely granulose, granules separate, elongate oval, convex, a few larger on the waves towards the margin, apical granules very small. All median valves and posterior valve showing a well-developed distinct dorsal area, which is superficially smooth, but under a lens shows pitting longitudinally on posterior half and transverse growth-lines anteriorly. The valves are deep, the depth being more than half their breadth, anteriorly narrowing and the posterior edge wavy with apical mucro. Sculpture as in anterior valve, the lateral areas not differentiated, rarely a slight wave or a large granule or two indicating their position. Posterior valve comparatively large, mucro elevated, postmedian, postmucronal slope steep, area flattened and concave, but not otherwise differentiated. Girdle densely clothed, with fine white spicules, sutural tufts, large and prominent, their spicules very fine and long. Interior white. Slits 5-1-7-9, variable in posterior valve. Dimensions: 25 x 12 mm. (Fig. 34.)

With this specimen was another which we have also figured and here describe:—

Shell elongate, valves narrow and deep, flattened, back rounded, posterior valve proportionately large, girdle broad, thickly spiculose, sutural tufts prominent. Sculpture coarse. Colour bright orange. Anterior valve with indistinct waves, three noticeable, two lateral ones only detected by large granules; granules large, separate, varying from elongate to rounded ovals in shape, larger towards the edges, apical portion with very small granules. Median valves and posterior valve with well marked dorsal area, fairly narrow, longitudinally pitted, pits becoming obsolete anteriorly where indistinct growth lines appear. Lateral and pleural areas coalesce without distinction, the granular sculpture consisting of large convex ovals. Valves strongly narrowed anteriorly, posterior edge sinuate and mucronate. Posterior valve comparatively large, mucro postmedian, postmucronal area small and deeply concave, granular sculpture smaller than of preceding valves. Girdle broad, densely clothed with very fine white spicules, prominent sutural tufts of similar larger spicules densely packed. Interior white. Slits 5-1-7-9, variable in posterior valve. Dimensions: 18.5 x 11 mm. (Fig. 33.)

Though of different appearance, owing to the coarser sculpture, this latter appears to be conspecific, as other details all coincide, and it is more than possible that this is a variant of *mariae*, and we now only admit it tentatively. The coarse variety may be named *fortior* until the puzzles of the Neozelanic *Notoplax* and *Craspedochiton* be solved. As noted above, it is possible these are conspecific with Ashby's *N. mariae haurakiensis*, and also with Miss Mestayer's *Macandrellus oliveri*.

34. Notoplax leuconota.

(Plate iii., figs. 3, 19-23.)

1912. *Acanthochites leuconotus* Hedley & Hull, Proc. Linn. Soc. N.S.W., xxxvii., 275, pl. xii., figs. 4, a-f. Lord Howe Island. Type in Australian Museum, Sydney.

The original description reads: "Shell elongated, valves carinated. Colour white, 5th and 6th median valves frequently with green spot on each side, the tip and sometimes the valve suffused with pink. Anterior valve with 5 strong radiating pustulose costae. Posterior valve similar to median valves, but without the prominent rib. Median valves; latero-pleural areas irregularly pustulose, the pustules on the lateral areas larger and less in number than those on the central areas; the areas separated by a ray of prominent pustules which increase in size towards the margin. Jugal tract not elevated, margined with pustules, V-shaped, transversely striate. Girdle broad, beset with short white spicules, and having 9 bunches of long white spicules on each side. Interior pearly-white, sinus broad, shallow. Anterior valve having 5, and median valve 1-1 slits. The posterior valve has 3 almost obsolete slits, edge thickened.

"Length: 12 mm.; breadth, 5.5 mm.

"Station: On the under side or at the edge of the insertion in the sand of small smooth stones, in pools or channels at low tide.

"Habitat: Lord Howe Island.

"Remarks: It resembles the Australian *A. costatus* in the strongly ribbed anterior and median valves, but differs from that species in the size and shape of the pustules; is broader and more elevated."

While the comparison with *A. costatus* was natural, this species shows more leaning to the New Caledonian *tridacna* Rochebrune,* in which the variation from *costatus* is exaggerated. *A. costatus* is the type of *Macandrellus*, which has precedence over *Loboplax*, when the sections are definable. Ashby's note that the species *costatus* is typically *Notoplax*, as contrasted with *Loboplax*, is, as usual, incorrect.

35. Notoplax cuneata.

(Plate iii., figs. 2, 9-12.)

1908. *Tonicia cuneata* Suter, Trans. New Zeal. Inst., 40, 1907, 360, pl. xxviii., figs. 1-2. Bay of Islands, N.Z. Unique type in Coll. Suter, now in Wanganui Museum.
1909. "*Tonicia cuneata* Thiele, Revision Chitonen, pt. ii. (Chun's Zoological, heft 56), 72, 1910." ("Is a *Spongiochiton* = *Loboplax*.")
1913. *Tonicia cuneata* Suter, Man. N.Z. Moll., 42, 1081. Atlas, pl. 5, fig. 1.
1914. *Craspedochiton cuneatus* Iredale, Proc. Mal. Soc., xv., 130.
1915. *Craspedochiton cuneatus* Iredale, Trans. N.Z. Inst., 47, 1914, 422, 425.

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* Hull & Risbec (Aust. Zool., 6, 1931, 378) used *Loboplax* for *L. tridacna*, following Pilsbry.

1928. *Pseudotonicia cuneata* Ashby, Trans. N.Z. Inst., 58, 1927, 393, pl. 40, figs. 8a, b, 9, 10. February 14, 1928.
1928. *Pseudotonicia cuneata* Bucknill, Trans. N.Z. Inst., 59, 626, text figs. 3-4. November 30.

This species with the appearance of a *Loboplax* was placed by Suter in the genus *Tonicia,* as he thought the surface was studded with eyes. Thiele indicated from study of the radula its correct location, which was accepted by Suter, whose original description reads:—

"Shell oblong-ovate, rather small, valves much raised, the intermediate valves beaked, angled above, with cuneiform sculpture. Anterior valve with 4 low and smooth ridges with serrated margins, corresponding with the slits, anterior margin with the same number of slightly projecting lobes, posterior margin a little concave; sculpture between the riblets consisting of deeply engraved grooves and punctures, leaving numerous wedge-shaped smooth patches of various size; the whole surface dotted with minute eyes. Of the intermediate valves, the first is notably larger than the following 5, all are sinuated on the latero-anterior sides and narrowed, convex in front and prominently beaked behind; dorsal area V-shaped, smooth, microscopically transversely finely striate; pleural tracts with a few narrow longitudinal and divergent serrated grooves; lateral areas not raised, with an anterior obtuse diagonal ridge, sculpture similar to that of the head valve; the small reddish eyes scattered over the whole surface. Posterior valve with a V-shaped dorsal area, its sides serrated, mucro at about the posterior fourth, posterior slope moderately concave, posterior margin slightly lobed, the lobes corresponding with the slits, sculpture beautifully wedge-shaped, with the postero-lateral ridges corresponding with the anterior slits; the whole surface covered with minute eyes. Girdle moderately broad, leathery, yellowish, almost naked, with very few silvery fine hairs near the margin. Colour a dirty white; anterior valve with the riblets reddish white, the grooves and punctures rusty; intermediate valves with the central area light olive, bordered by white, ornamented with very fine longitudinal reddish lines; grooves on the pleural and lateral areas rusty, a few light-blue spots scattered over the areas; posterior valve having the central area coloured as the intermediate valves, the grooves rusty, the cuneiform nodules on the pleural tracts light blue; white, with a few blue spots, posteriorly. Inferior greenish-white, without any strong callosity. Anterior valve with 4 slits, the 2 central ones broader; intermediate valves with 1 slit on each side, and posterior valve with 7 inequidistant slits; all teeth of the first 7 valves finely pectinated and sharp, but those of the tail valve are stout, deeply grooved, rather blunt-edged. All the insertion plates are high; sinus flat, finely denticulate; sutural laminae angularly produced, rather thin; valve-callus not much raised. Length, 22 mm.; breadth, 11 mm. (dry specimen). Divergence 78 deg. Animal with the gills extending nearly the whole length of the foot.

"Habitat: Bay of Islands.

"Remarks: This shell is distinguished by its peculiar cuneiform sculpture from all the other species of the genus known to me. A curious feature of this species are (sic) the minute punctures scattered over the whole surface of all valves, not confined to the lateral areas, only the intermediate valves. I took them for eyes, but I may be wrong. I have only one specimen, and it is highly desirable that more examples should be obtained and carefully examined."

A note was added later. "Thiele to whom I sent a piece of the radula has come to the conclusion that the species should be classed under *Spongiochiton* = *Loboplax*."

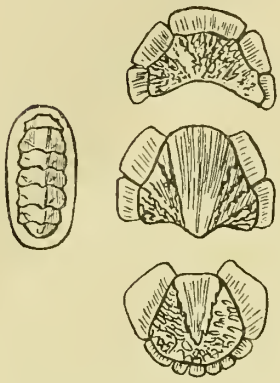

Fig. 2. *Notoplax* (*Tonicia*) *cuneata*. After Suter.

The figures given, here reproduced, show very crudely a seven-valved shell, and, better, three separate valves. The species was recognised later by Mr. A. Brookes, who had "one of the two original specimens," according to Ashby, though Suter himself stated there was only one. Mr. Brookes handed his material to Ashby, who published its rediscovery, with the introduction of a new genus *Pseudotonicia* and a subfamily *Pseudotoniciinae*. The features of the shell are typically those of Loboplax, as our figures show. The specimen figured is not much like Suter's figure or description, so that we were at a loss to reconcile them until we found a slight suggestion of the sculpture Suter described. The whole surface is shining and smooth, a few V-shaped cuts towards umbones of valves, pleural areas smooth, but in older shells with longitudinal grooves; girdle wide with sutural tufts obsolete. Suter's remarks about eyes misled Ashby, and we now know that these "eyes" have nothing to do with the Tonicioid eyes and are present in many "eye-less" shells.

The dissection shows that in this case the external sculpture can become lost while the internal features persist. It seems to be a parallel development in Neozelanic waters of *Bassethullia* * in Australian waters, the species *B. glypta* recalling the Neozelanic shell in detail, but not in general appearance. We have suggested that the Australian genus may be regarded as an offshoot of the pre-*Notoplax* stem, and we conclude that the present species stands somewhat similarly to the *Loboplax* series. The difference in status allowed by us is made with due regard to the species and genera dealt with, the variable *"mariae"* series and the perplexing *"rubiginosus"* complex, demanding less value for this offshoot than has been deemed suitable in Australia where the species appear to be much less variable and more stable.

36. Notoplax facilis *sp. nov.*

(Plate iii., fig. 13.)

Shell elongate, valves narrow, very deep, flattened, roundbacked, posterior valve long, girdle broad leathery, with very long prominent asbestos-like sutural tufts. Sculpture coarse. Colour greenish-grey, with a few black specks. Anterior valve small, convex, showing no waves; the median and posterior valves with very pronounced dorsal area, narrow, smooth, with transverse growth lines only; pleural and lateral areas not differentiated at all, covered with large irregularly rounded elevated pebbles, a few small ones adjacent to the dorsal area; anterior valve covered with similar pebbles, not quite as large, and beginning with small ones at the

* Pilsbry (Nautilus 41, 1928, 105, footnote) proposed this genus name for *Glyptelasma*, I. & H., preoccupied.

apex. Posterior valve with mucro at posterior fourth, the postmucronal slope steep, a little concave, pebbling a little smaller. Girdle broad, leathery, with very long sutural tufts.

Dimensions: 26 x 12 mm.

Station: Under a stone in a deep rock pool.

Habitat: Shag Point, Otago Peninsula, South Island.

Remarks: The unique specimen collected many years ago by Messrs. W. R. Oliver and T. Iredale is so remarkable that the beautiful figure here offered will make its recognition unmistakable.

xi. Genus Craspedochiton.

1853. *Craspedochiton* Shuttleworth, Mittheil. Naturf. Gesell. Berne, 67. Type by monotypy *Chiton laqueatus* Sowerby.

1882. *Angasia* Dall, Proc. U.S. Nat. Mus., 1881, 283, 286, 289, 290. Type by original designation *Angasia tetrica* Carpenter, Ceylon, shell not described. ? Nomen indet.

1893. *Angasia* Pilsbry, Man. Conch., xiv., 286, ex Cpr. MS. Type by monotypy *Angasia tetrica*, pl. 61, figs. 27-32 (ex Cpr. MS.), Ceylon. Not *Angasia* White, P.Z.S., 1863, 498.

1882. *Spongiochiton* Dall, Proc. U.S. Nat. Mus., 1881, 283, 286. Type by monotypy *S. productus* Cpr. Not described. ? Nomen indet.

1892. *Spongiochiton* Pilsbry, Man. Conch., xiv., 26.

1892. *Spongiochiton* Pilsbry, Man. Conch., xiv., 26. Type by monotypy *S. productus* ex Cpr. MS. described = *A. carpenteri* Pilsbry, Man. Conch., xv., 35, pl. 1, figs. 14-22. Type described from Carpenter's MS. figures. Cf. Iredale, Proc. Mal. Soc., ix., 1910, 100.

1893. *Phacellozona* Pilsbry, Nautilus, vii., 139. New name for *Angasia supra.*

1909. *Thaumastochiton* Thiele, Revision Chitonen, pt. I. (Chun's Zoologica, heft 56), 34. Type by monotypy *Craspedochiton* (*T.*) *mobiusi* Thiele.

1926. *Amblyplax* Ashby, Proc. Mal. Soc., xvii., 8, 18. Type by original designation *Notoplax oliveri* Ashby.

1926. *Lophoplax* Ashby, Proc. Mal. Soc., xvii., 11, 29. Type by original designation *Lophoplax finlayi* Ashby.

This group has puzzled and perplexed all workers, the erudite Carpenter using *Craspedochiton*, and proposing *Angasia* and *Spongiochiton* as well. Pilsbry did not recognise the association of these groups, allowing their wide separation and distinction. Little blame can be attached to this action, as Pilsbry was autoptically unfamiliar with them. Their relationship was better recognised by Thiele, who introduced a subgenus *Thaumastochiton* for a curious variation.

Ashby's attempts to deal with the series make curious reading, as having seen the type of *Craspedochiton* he recognised a congeneric species, but the same species in its immature state he allotted to a different genus. The Neozelanic species ascribed, doubtfully, be it noted, by Iredale to *Craspedochiton* Ashby rejected, and introduced two new names, one for a tailless juvenile shell, so obviously the young of the other that the error is inexplicable. Consequently, if this group can be split up, there are plenty of names available for the components.

The striking features of the true *Craspedochiton* are the short insertion plates, the Ischnochitonid sutural laminae, the multislit short insertion plate of the posterior valve and the asymmetrical girdle. The animal is very small, and when Iredale studied the series in the British Museum he even suggested that only one variable species existed, and that perhaps

even the Neozelanic shells would be included. The fact that Ashby should regard the immature as *Notoplax* and the adult as really *Craspedochiton* fully indicates the difficulties in connection with these species. Again, Ashby has drawn attention to the "fluted insertion plate, which is typical of the genus *Craspedochiton*," and then in his diagnosis of his *Amblyplax* states "insertion plate . . . fluted." As a matter of fact, the anterior valve of *Craspedochiton* figured by Ashby was from a specimen showing much "fluting," but other specimens from the same lot even, paratypes, do not show that feature strongly. The degeneration of the insertion plate of the posterior valve so pronounced in the species separated by Thiele under the name *Thaumastochiton* is easily paralleled in a series of specimens of Neozelanic shells, which up to the present have even been regarded as conspecific, some shells almost showing an unslit callus, others few slit, others many slit, but all short and characteristic.

Amblyplax was diagnosed as "Having multifissate tail valve, posterior insertion plate narrow, thickened, blunt edged, and fluted, girdle clothed with spicules or irregular, minute scales or both. Type *A. oliveri* Mestayer (MS.)." On page 18, Ashby names as the type *"Macandrellus oliveri* Mestayer," and then described the species under the name *Notoplax (Amblyplax) oliveri;* also adding to the subgeneric definition, "girdle often asymmetrical." Then Ashby, examining a minute baby shell, only 2 mm. long, with the tail valve missing, introduced a new genus *Lophoplax,* a most reprehensible action, as he admitted, "in the absence of this important part of the animal, it is impossible to determine the exact niche in the acanthoid phylum which this peculiar form should rightly occupy." The word "acanthoid" is a vulgarism of Ashby's coining, which should never have been printed, being meaningless; he paralleled it with "ischnoid," another indefensible slang concoction. The word "phylum" should not be used in Ashby's sense.

Ashby then indicates features of this baby shell which he states are "non-acanthoid," but which he had a few pages earlier described under his *Notoplax (Amblyplax) foveauxensis* of which his *Lophoplax finlayi* is undoubtedly the very juvenile. As a matter of fact, a little older specimen from the same dredging Ashby himself determined as *foveauxensis,* but his own figures prove the identity.

37. CRASPEDOCHITON RUBIGINOSUS.
(Plate iii., figs. 4, 24-32.)

1872. *Tonicia rubiginosa* Hutton, Trans. New Zeal. Inst., iv., 1871, 180. Off Island of Kapiti, N.Z. Type in Colonial (now Dominion) Museum, Wellington, N.Z.
1873. *Tonicia rubiginosa* Hutton, Cat. Mar. Moll. N.Z., 49.
1880. *Tonicia rubiginosa* Hutton, Man. N.Z. Moll., 114.
1893. *Tonicia rubiginosa* Pilsbry, Man. Conch., xv., 107. (Hutton's description copied, unidentified).
1897. *Acanthochites (Loboplax) costatus* Suter, Proc. Mal. Soc., ii., 194, July. (Type of *rubiginosus* only examined).
1904. *Acanthochites rubiginosus* Hutton, Index Faunae N.Z., 86.
1905. *Acanthochites rubiginosus* Hamilton, Col. Mus. Bull., No. 1, 36.
1905. *Acanthochites (Loboplax) rubiginosus* Suter, Journ. Malac., xii., 68, pl. ix., figs. 12-17, December 30. (Type included but Foveaux Strait specimens described).

[The above references include the type of *rubiginosus*; the succeeding ones mainly refer to Foveaux Strait specimens.]

1904. *Plaxiphora terminalis* Wissel, Zool. Jahrb. Abt. Syst., 20, 679. (Error only). Suter, Nachr. D. Malak. Ges., 41, 74. Correction.
1909. *Acanthochites (Loboplax) rubiginosus* Suter, Subant. Islands of N.Z., i., 3. Auckland Island.
1910. *Acanthochites rubiginosus* Iredale, Proc. Mal. Soc., ix., 155.
1913. *Acanthochites rubiginosus* Suter, Man. N.Z. Moll., 29. Atlas, pl. 4, fig. 4.
1914. *Craspedochiton rubiginosus* Iredale, Proc. Mal. Soc., xi., 130.
1915. *Craspedochiton rubiginosus* Iredale, Trans. New Zeal. Inst., 47, 1914, 425.
1924. *Craspedochiton rubiginosus* Odhner, Vidensk. Medd. Dansk. Nat. Foren. Bd., 77 (N.Z. Moll.), 8.

[The above include any or all of the forms, but the following relate to the localities indicated therewith.]

1926. *Notoplax (Amblyplax) foveauxensis* Ashby, Proc. Mal. Soc., xvii., 20, pl. i., figs. 5a-c. April 30. ex Mestayer MS. Foveaux Strait, 15 fathoms, N.Z. Type in Dominion Museum.
1926. *Acanthochiton foveauxensis var. kirki id. ib.*, ex Mestayer MS. As a synonym.
1926. *Acanthochiton foveauxensis* Mestayer, Trans. N.Z. Inst., 56, 585, pl. 100, figs. 9-12, May 5. Foveaux Strait.
1926. *Acanthochiton foveauxensis var. kirki, id. ib.*, 586, pl. 101, figs. 1-4. No locality given.
1926. *Lophoplax finlayi* Ashby, Proc. Mal. Soc., xvii., 29, pl. iii., fig. 4, pl. iv., figs. 1-4. April 30. 60 fathoms, off Otago Heads, N.Z.
1926. *Notoplax (Amblyplax) oliveri* Ashby, Proc. Mal. Soc., xvii., 18, pl. 1, figs. 4, a-c. April 30. ex Mestayer MS. Hauraki Gulf, 20 fathoms, N.Z. Type in Dominion Museum, New Zealand.
1926. *Macandrellus oliveri* Mestayer, Trans. New Zeal. Inst., 56, 586, pl. 101, figs. 5-9. May 5. Hauraki Gulf, 20 fathoms, N.Z.

Examination of Ashby's photographs or Miss Mestayer's drawings would allow of the distinction of the three or four or more forms that have been already named. The discrimination into their groups of a series of shells enforces a restraint as to the recognition of these species that becomes more powerful the larger the series examined. The narrow highly keeled smooth *"oliveri"* contrasts widely with the broad low rough *"foveauxensis,"* while *"rubiginosus"* is narrow, highly keeled but rough. It is curious that the same kind of variation can be seen in the Australian *Craspedoplax variabilis,* where from a collection, broad low shells being the common phase, long narrow elevated shells may be picked out. In Australia we have allowed geographic variation, but in New Zealand while *foveauxensis* seems abundant in the south it is also met with in the north.

Hutton described this species as follows: *Tonicia rubiginosa. Chiton rubiginosus* Swains. MS. Oblong; margin slightly tomentose; valves rather elevated, sub-carinate, flattened on each side; posterior margins straight, produced into an acute central point; lateral areas indistinct, the whole surface rather coarsely granular, the granules smaller on the back. Length, .45 inch; breadth, .2 inch. Colour: Pink, getting yellowish on the back.

This species is named from a specimen from the late Mr. W. Swainson's cabinet, and now in the Colonial Museum, which is labelled as coming from the island of Kapiti. Suter then subordinated it to the Australian *costatus,* writing:—

"On examining Hutton's type specimen of *Tonicia rubiginosa*, which is in the Colonial Museum, Wellington, I found it to agree with the description of *A. costatus*, and two specimens I have, which were dredged in Foveaux Straits, also belong to the same species. The specimen in the Colonial Museum has lost its colour entirely, but of my specimens one is yellowish-pink, and the other, a young shell, is most beautifully ornamented with pink, white, light-brown, and blue. The dimensions of Hutton's type specimen are: Length, 11; breadth, 5 mm. Habitat: The species has hitherto been found in Cook Strait and Foveaux Strait. In the latter locality it is found with *Chiton canaliculatus*. Very rare."

This association was incorrect, as pointed out by Pilsbry, and therefore under the name *A. rubiginosus* Suter described the same shells:—

"Shell oblong, small, subcarinate, the whole surface granular, mostly yellowish-pink, girdle with minute spines and sutural tufts. Anterior valve with five ribs which are not very conspicuous, the whole surface granulated, the granules being largest, and sometimes unequal in shape, near the margin, and decreasing in size towards the apex of the valve, which is slightly sinuated. Intermediate valves with the jugum sparsely longitudinally substriated; the pleural tracts are granular; the lateral areas, but slightly raised and not very clearly separated from the pleural tracts, are similarly sculptured, the granules being again largest near the margin, round or oval in shape. The valves are subcarinate, beaked posteriorly. Posterior valve small, the mucro central, with a smooth triangular area in front, beyond which the whole surface is granular, the granules being comparatively large. Posterior slope concave, no signs of radiating ribs. Girdle thick, fleshy, beset with microscopic white spicules; there are sutural tufts of white spicules, 7 on each side, and 4 tufts in front of the head valve. Colour: This is, as I pointed out in my former paper, variable, adult specimens showing mostly a pinkish colour, yellowish on the back, but young shells sometimes have a most beautiful colour arrangement, the granules being white, pink, light brown and light blue. The jugal tract is in the intermediate and tail valves of a darker colour, mostly reddish brown and assuming triangular shape. The girdle is light fulvous with small patches, and radiate bands of whitish-yellow. Interior white, but the centre of the valves, head valve excepted, is pink coloured; the sinus is rather narrow and deep. The anterior valve with 5 slits, corresponding with the ribs; intermediate valves with 1 slit on each side, strong teeth, and a stout valve-callous; posterior valve with a low, thick insertion plate and 4 short slits. Length, 17; breadth, 13 millim; divergence, 103 deg."

This description and the figures Suter gave accompanying this correction were drawn up from the Foveaux Strait specimens, not Hutton's type. These differed in breadth and shape, but agreed in general features, and have been the commonly accepted *rubiginosus*, as the variation was somewhat indeterminate, and most specimens were secured from the oyster beds of Foveaux Strait. When Iredale examined the Loricates in the British Museum, sets from Northern New Zealand showed shells like the Foveaux Strait form, and others, narrow and elevated, superficially different, but no good character could be found distinguishing them. These appear to be the ones separated as *oliveri* by Ashby and Mestayer.

Recently, Miss Mestayer regarded the so-called *"rubiginosus"* as separable into more than one species, and specimens were submitted to Ashby, who also separated this series. Each published their results independently,

but Ashby fortunately used Miss Mestayer's names, though his account appeared a few days earlier.

Ashby decided that the true *rubiginosus* had not since been recognised and therefore named the supposed *"rubiginosus"* as new. His effuse descriptions cannot be transcribed here, as they would only be confusing, and unfortunately Miss Mestayer's descriptions do not emphasise the salient points. Ashby's results read:—

Notoplax (*Amblyplax*) *oliveri*. Hauraki Gulf, 20 fathoms.

Notoplax (*Amblyplax*) *foveauxensis*. Foveaux Strait, 15 fathoms.

Notoplax (*Amblyplax*) *rubiginosus*. Kapiti Island, Cook Strait.

Lophoplax finlayi. Off Otago Heads, 60 fathoms.

Miss Mestayer's treatment reads:—

Acanthochiton foveauxensis. Foveaux Strait.

Acanthochiton foveauxensis var. kirki. No locality.

Macandrellus oliveri. Hauraki Gulf, 20 fathoms.

Consideration of the descriptions and figures given by these two workers necessitates the supposition that unless *Notoplax oliveri* Ashby differs from *Macandrellus oliveri* Mestayer, there is nothing to separate the former from *rubiginosus* Hutton.

The majority of the specimens from the oyster beds in Foveaux Strait in 15 fathoms are low and broad and coarsely sculptured, and differ superficially very much from the elevated, narrow finely sculptured shells Miss Mestayer has called *oliveri*. We have figured the two extremes and would have liked to continue their separation, but so many shells would thus become unintelligible that we are compelled to unite them temporarily.

Ashby's *oliveri* is a narrow elevated coarsely sculptured shell, and his *"foveauxensis"* from 60 fathoms, off Otago Heads, the adult of his *"Lophoplax finlayi,"* shows the development from fine to coarse sculpture in the valves figured.

The insertion plates vary a little in length in accordance with the elevation of the shell, and in the least elevated the plate of the posterior valve becomes diminished so that it is scarcely recognisable save by the presence of degenerate teeth. The number varies, according to stress, as some shells show as many as thirteen small irregular slits in the posterior valve, while other may have as few as five as in the figure. The external nodulation begins as small elongate ovals and sometimes continue as such, but usually develop into larger, more convex and become more circular.

We describe hereunder the two extremes which we have figured, known as *foveauxensis* and *oliveri*.

(a). *C. foveauxensis*. (Fig. 4.)

Shell broadly oval, elevated, roundbacked, posterior valve of medium size, valves broad and fairly shallow, girdle broad, finely scaly, sutural tufts not prominent. Colour rose, median ridge darker. Anterior valve with obscure waves, indistinctly marked, granules at edge rounded, small, convex, separate, apically smaller and more elongate. Median valves with very narrow striate dorsal area, edged with longitudinal grooves, forming elongate oval pustules, which decrease laterally and become rounded on the lateral area which are elevated but not otherwise distinguished; valves

in depth about one-third their breadth, posterior edge almost straight, mucro small and not very noticeable. Posterior valve with mucro central, postmucronal area slightly concave.

A juvenile shell shows anterior waving more pronounced, sculpture more developed, granules less convex, etc., etc.

Dimensions: 19.5 x 13 mm.

(b). *C. oliveri.* (Fig. 32.)

Shell elongate, elevated, valves semi-keeled, back slightly rounded, posterior valve small, girdle broad, scaly, with sutural tufts small. Colour, brown-rose. Anterior valve with five indistinct waves not differentiated sculpturally; granulose throughout, small, well separated convex ovals, becoming larger towards the edge. Median valves broad with depth less than half their width and not narrowed anteriorly; dorsal area not separated, but sculpture less marked, being narrowly longitudinally striate, granules developing from the separated striations, and becoming broader as they are produced laterally; the lateral areas are not differentiated by means of a rib but are elevated and their sculpture is a little coarser; the posterior edge of the median valves is mucronate. Posterior valve small, mucro median, depressed, postmucronal area small and a little concave.

Dimensions: 19 x 10 mm.

It may be noticed that Miss Mestayer's *foveauxensis* is not so strongly sculptured as the shell we figure, while her variety *kirki* seems more like the form we are regarding as normal. Miss Mestayer also noted the variation in her *"Macandrellus oliveri,"* and it may be that she has confused the form of *mariae* with that of *rubiginosus* which occurs there. In this respect we may note that we received specimens of *rubiginosus* (= *oliveri*) as *mariae*, but we demurred strongly from this determination, and it was not until some time had elapsed that we unravelled the mystery of the complex, some shells having been compared with *mariae* and rightly regarded as conspecific, but others from the same place were sent us which were the *"oliveri"* form of *rubiginosus*, the two not being distinguished by the sender.

VI. Family Cryptoplacidae.

This family has not yet been recognised in New Zealand proper, but enters into this place through the occurrence of a species on Lord Howe Island.

The general appearance of these Loricates is distinctive, being elongate, fleshy, with small valves and densely spiculose girdle, this feature at sight separates them from *Cryptoconchus*, whose description would read similarly. It is noteworthy that, though a feature of the tropics species are abundantly found in southern Australia, and typical valves have been found in the tertiary beds of southern Australia, indicating their long life in that region. The family has undoubtedly developed from Cryptoconchid ancestors, as the juveniles are very like some species of Acanthochitonid groups such as *Notoplax*. The valves show diminution and separation with age, and species differ in that respect also, one species scarcely showing as much tegmentum as *Cryptoconchus*. In the latter case, however, the articulamentum still remains very large, while in the *Cryptoplacidae* it also is much reduced. The insertion plates are generally

large and more or less thrown well forward, the slits becoming obsolete in all except the anterior valve, where three may still generally be seen, but remains of the other two may persist. The external sculpture is granulose in the juvenile, but becomes linear with age, a narrow dorsal area being generally well marked and smooth; the lateropleural areas inseparable; the mucro of the posterior valve commonly terminal. Girdle very large, densely spiculose, in life showing sutural tufts, sometimes apparently missing in dried shells; spicules vary in size and shape.

xii. Genus CRYPTOPLAX.

1818. *Cryptoplax* Blainville, Dict. Sci. Nat. (Levrault), xii., 124. Type by subsequent designation (Haddon Chall. Rep., xv., 1886, 37), *Chiton larvaeformis* Burrow.

1819. *Chitonellus* Lamarck, Hist. Anim. sans. Vert., vi., pt. 1, 316. Type by tautonymy *C. laevis* = *Chiton larvaeformis* Burrow.

1836. *Oscabrella* Broderip, British Cyclopaedia, ii., 31 (as of Lamarck). Type by monotypy *Chitonellus laevis* Lamarck.

1846. *Chitoniscus* Herrmannsen, Index Generum Malac., 225. New name for *Chitonellus* Lamarck.

1848. *Ametrogephyrus, Phaenochiton* and *Dichachiton* Middendorff, Mem. Sci. Nat. Acad. Imp. Sci. St. Petersb., vi., 1847, 97. February, 1848. Type by subsequent designation (Iredale & Hull, Austr. Zool., iv., 1925, 101), *Chiton larvaeformis* Burrow.

[Only one genus is at present recognised in the family.]

38. CRYPTOPLAX ROYANA.

(Plate iii., figs. 14-18.)

1925. *Cryptoplax royana* Iredale & Hull, Austr. Zool., iv., 108, pl. xii., figs. 8, 16, 24. Lord Howe Island. Type in Australian Museum.

1927. *Cryptoplax royana* Iredale & Hull, Mon. Austr. Loricates, 98, pl. xi., figs. 8, 16, 24.

"Size comparatively small, valves disconnected posteriorly, but not as much as those of *C. larvaeformis* of the same size. Fifth valve large, the last five being almost all the same size, elongate and narrow. Coloration bright pink mottled with scarlet, anterior valve sometimes white, girdle white. Anterior valve elongately semicircular, ornamented with longitudinal wrinkly lines, wavy anteriorly. Median valves with smooth dorsal area, wrinkly longitudinal lines, five in number on each side; juvenile sculpture shown by two nodules. Posterior valve with mucro elevated, terminal, postmucronal slope nearly perpendicular. Girdle spicules long and pointed, striate. Interior white. Posterior slope nearly perpendicular. Dimensions: 29 x 7 mm. Station: In crevices of coral rock. Habitat: Lord Howe Island."

We have figured the anterior valve in which it will be seen that five slits appear, the three median being long, the two outside being short, a feature not otherwise noted in this genus.

EXPLANATION OF PLATE III.

Fig. 1. *Notoplax violacea* Quoy & Gaimard, whole shell.
„ 2. *Notoplax cuneata* Suter, whole shell.
„ 3. *Notoplax leuconota* Hedley & Hull, whole shell.
„ 4. *Craspedochiton rubiginosus* Hutton, whole shell.
„ 5. *Notoplax violacea* Quoy & Gaimard, exterior of anterior valve.
„ 6. *Notoplax violacea* Quoy & Gaimard, exterior of median valve.
„ 7. *Notoplax violacea* Quoy & Gaimard, exterior of anterior valve.
„ 8. *Notoplax violacea* Quoy & Gaimard, side view of posterior valve.
„ 9. *Notoplax cuneata* Suter, side view of posterior valve.
„ 10. *Notoplax cuneata* Suter, exterior of median valve.
„ 11. *Notoplax cuneata* Suter, exterior of posterior valve.
12. *Notoplax cuneata* Suter, exterior of anterior valve.
„ 13. *Notoplax facilis* Iredale & Hull, whole shell.
„ 14. *Cryptoplax royana* Iredale & Hull, whole shell.
„ 15. *Cryptoplax royana* Iredale & Hull, exterior of anterior valve.
„ 16. *Cryptoplax royana* Iredale & Hull, exterior of median valve.
„ 17. *Cryptoplax royana* Iredale & Hull, side view of posterior valve.
„ 18. *Cryptoplax royana* Iredale & Hull, exterior of posterior valve.
„ 19. *Notoplax leuconota* Hedley & Hull, exterior of median valve.
„ 20. *Notoplax leuconota* Hedley & Hull, interior of median valve.
„ 21. *Notoplax leuconota* Hedley & Hull, exterior of anterior valve.
„ 22. *Notoplax leuconota* Hedley & Hull, exterior of posterior valve.
„ 23. *Notoplax leuconota* Hedley & Hull, interior of posterior valve.
„ 24. *Craspedochiton rubiginosus* Hutton, exterior of anterior valve.
„ 25. *Craspedochiton rubiginosus* Hutton, interior of anterior valve.
„ 26. *Craspedochiton rubiginosus* Hutton, side view of posterior valve.
„ 27. *Craspedochiton rubiginosus* Hutton, exterior of posterior valve.
„ 28. *Craspedochiton rubiginosus* Hutton, interior of posterior valve.
„ 29. *Craspedochiton rubiginosus* Hutton, interior of median valve.
„ 30. *Craspedochiton rubiginosus* Hutton, exterior of median valve.
„ 31. *Craspedochiton rubiginosus* Hutton, elevation of median valve.
„ 32. *Craspedochiton rubiginosus* Hutton (*oliveri*), whole shell.
„ 33. *Notoplax brookesi* Ashby, *fortior* Iredale & Hull, whole shell.
„ 34. *Notoplax brookesi* Ashby, whole shell.
„ 35. *Notoplax mariae* Webster, whole shell.